



ESE Capability/Needs Update

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Overview

- Background
- Status on the Capability/Needs update
- What is new
- Major differences
- What's next
- How can TST help

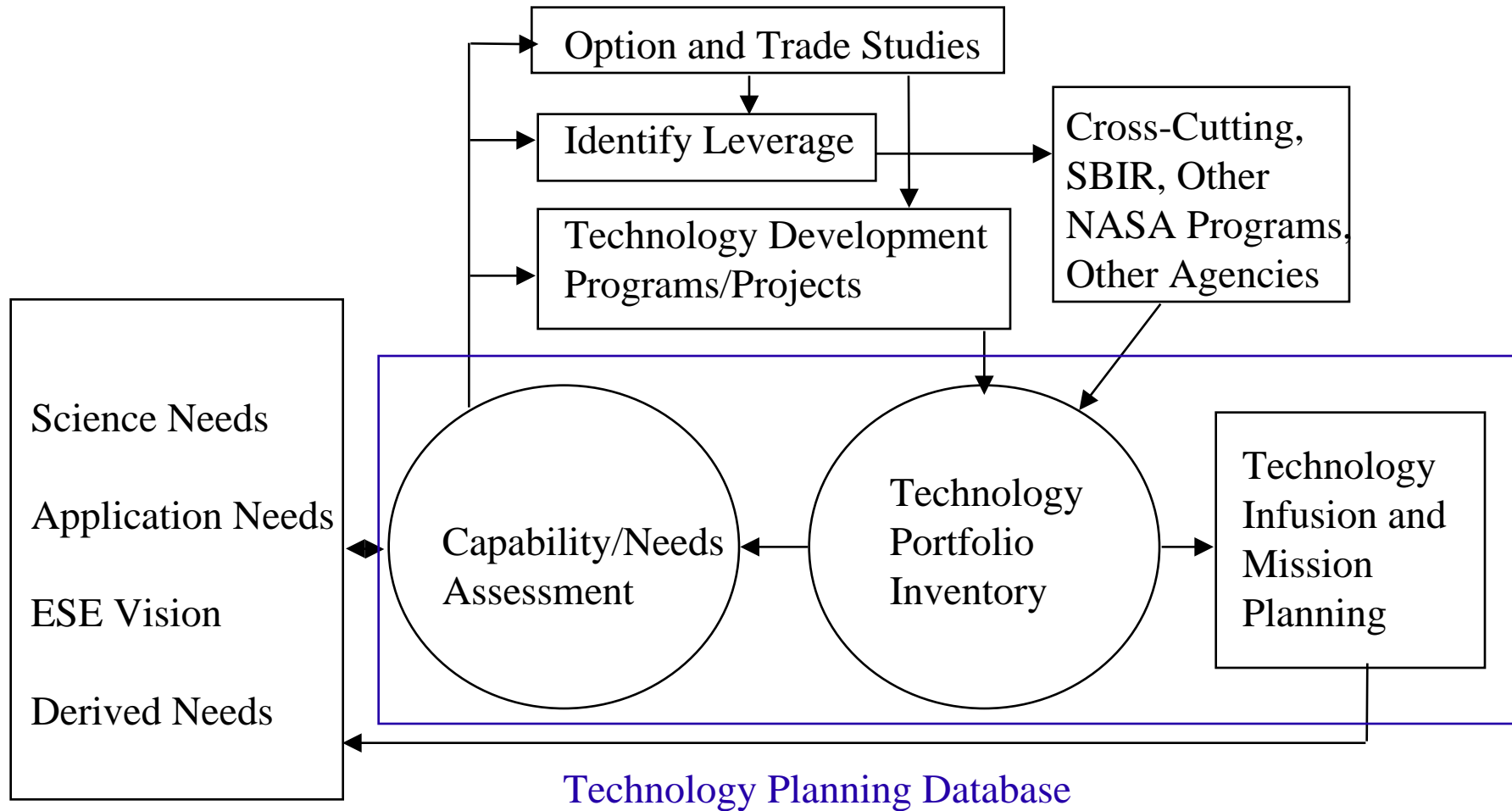


Background

- The Capability/Needs Assessment (CNA) was first compiled in 1997 by Barbara Wilson and Jeff Simmonds of JPL. The document was in a word table format, and was signed off by all the HQ science program managers except the Land Cover & Land Use theme manager.
- ESTO took custody of the CNA in 1998, converted it into a searchable database, and posted the database on ESTO Website (<http://esto1.gsfc.nasa.gov:591/>).
- The CNA has been re-organized following the re-programming of the ESE Science Program (from the original 5 themes to a 7-theme, then to a new 5-theme).
- The CNA was referenced by the IIP NRA, and is being referenced by the ATI and AIST NRAs.

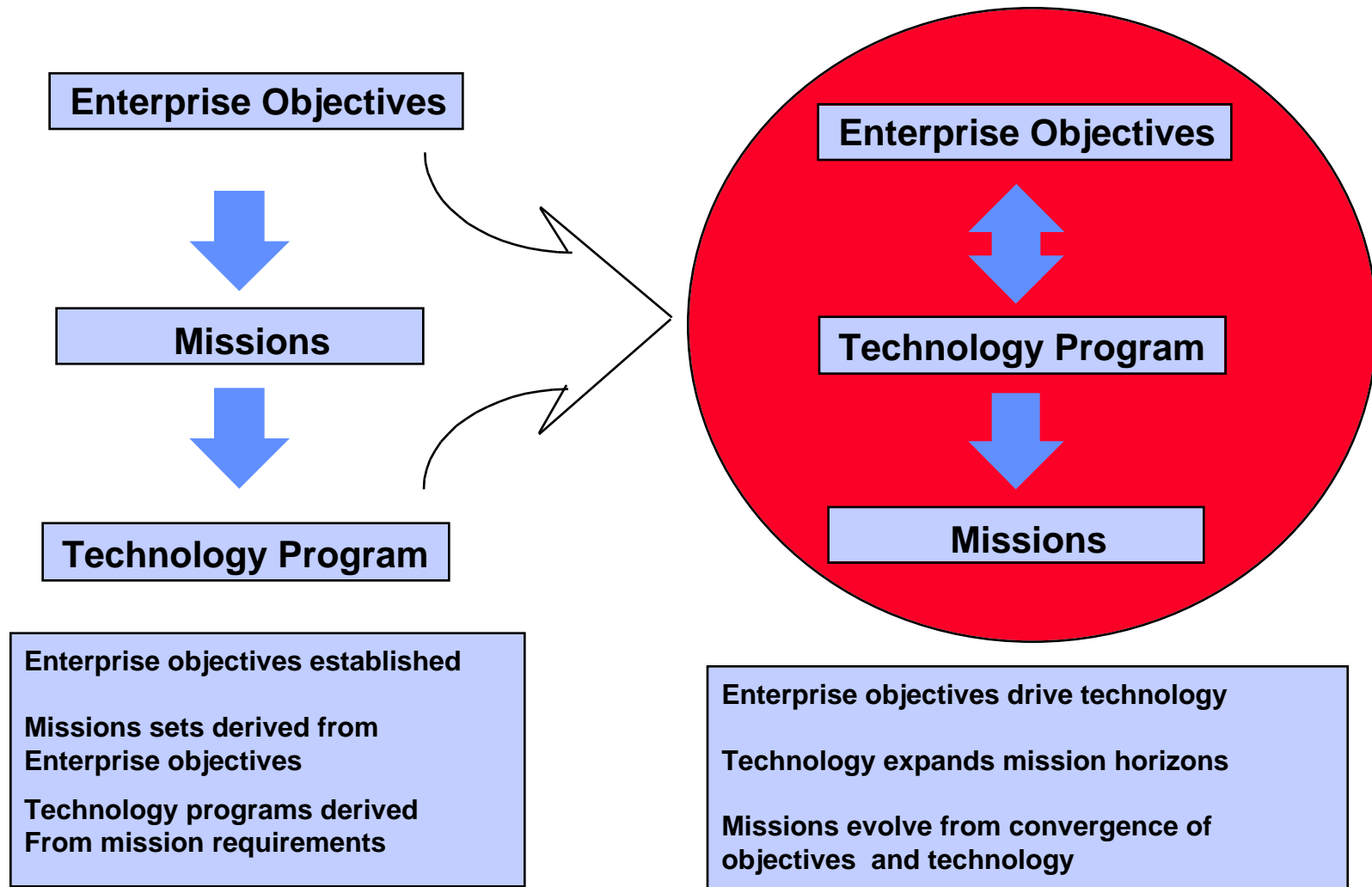


CNA in the Technology Planning Process





Old or New, CNA is Critical





ESTO Technology Planning Database

Find	Find All	Sort	Category	Current Identified by RFI	Record No.
					63
Science Theme 4. GLOBAL WATER CYCLE					
Science Needs 4.1 Soil Moisture					
Measurement Goals & Requirements					
<ul style="list-style-type: none">- global coverage - horizontal res. 10 km or less (ideally 1 km)- revisit time 1-2 days (New Req?- revisit time: ~ 3 days)- accuracy 10-20% of upper soil layer capacity (may be 1-5 cm water equivalent)					
Issues :					
<ul style="list-style-type: none">- Is there science value in improved horizontal resolution (10-30 m instead of 1 km)?- Is there need for topographical data for models, and if so, is it covered adequately elsewhere?					
Measurement Approaches					
Single or multi frequency & polarization thermal microwave emission from moist versus dry soil					
Instrument Requirements					
Instrument Heritage					
Instrument Option In-space, single L-band or multi L- & S-band , dual polarization imaging radiometer: (single frequency, vertical/ horizontal polarization is probably minimal to discriminate effects of vegetation from those of soil moisture)					
System Requirements Challenges					
<ul style="list-style-type: none">- antenna aperture of 10-20m to achieve req'd spatial res.- achievement of multi frequency & polarization capability in small, affordable package- feasibility of single frequency, single polarization instrument to discriminate effects of vegetation from those of soil moisture (may also need single TIR channel to discriminate surface temp)					
Two competing approaches:					
<ul style="list-style-type: none">- large lightweight inflatable antenna for real aperture approach- deployable antenna (thinned sparse array) and low power correlators for synthetic aperture approach utilizing an array of (1000's of) receivers					
Subsystem Component Technology					



ESTO Technology Planning Database

Task Title	<input type="text"/>		
Task Description	<div><div></div><div></div></div>		
POC Name	<input type="text"/>	Institution	<input type="text"/>
Phone	<input type="text"/>		
E-mail	<input type="text"/>		
Funding Program	<input type="text"/>	FY to Reach TRL 6	<input type="text"/>

Funding Profile (K)	FY 99 <input type="text"/>	FY 00 <input type="text"/>	FY 01 <input type="text"/>
	Current TRL <input type="text"/>	TRL 99 <input type="text"/>	TRL 00 <input type="text"/>

Related Notional Mission	<input type="text" value="EX-4: Soil Moisture and Ocean Salinity Observing Mission"/>		
Mission Description	<div><div></div><div></div></div>		
Mission Implementation Begin	<input type="text"/>	Mission Launch	<input type="text"/>
Mission Duration	<input type="text"/>		
Mission Website	<input type="text"/>	<input type="button" value="Link Mission Site"/>	



Status on the Capability/Needs Update

- With all the changes in ESE science themes and mission planning, the content of the CNA has not been updated since it was generated.
- An ESE Science & Technology Workshop was convened on July 14-15 to update the CAN. Seven sessions were conducted:
 - Atmospheric Chemistry and Ozone
 - Climate Change and Variability
 - Global Carbon Cycle
 - Global Water Cycle
 - Radiation Forcing and Energy Balance
 - Solid Earth Science
 - Applications
- Each session was chaired jointly by a science and a technology co-chair. The co-chairs of these seven sessions agreed to provide detailed update of the needs and capabilities to ESTO by the end of August.



Status on the Capability/Needs Update (Continued)

- Current Status:
 - Have received the following:
 - Atmospheric Chemistry
 - Global Water Cycle
 - Climate Variability and Change
 - Global Carbon Cycle (pending a final review)
 - Applications (at this TST)
 - To be received:
 - Radiation Forcing and Energy Balance
 - Solid Earth Science
- A working copy of the FileMaker Pro database is posted on the ESTO Website. Feedback is encourage to be sent to the session co-chairs for inclusion/modification before October 1, 1999.



What is new

- In addition to the needs and capabilities of the 5 science themes, the following are added to the ESTO Technology Planning Database:
 - ESE Applications Program needs: following the ESE Applications Implementation Plan
 - Derived Needs: following the ESTO Program product lines that provide cross-cutting support:
 - Information System Technology
 - Data Collection
 - Transmission
 - Data & Information Production
 - Analysis, Search & Display
 - Systems Management
 - Infrastructure



What is new (Continued)

- Platform Technology
 - Propulsion
 - Power
 - Thermal
 - Guidance, Navigation & Control
 - Communication
- Healthy growth in the number of needs tracked:

– Atmospheric Chemistry	29	31
– Climate Variability and Change	19	30
– Global Water Cycle	15	16
– Global Carbon Cycle (prelim.)	09	28
– Information System Technology	--	37
– Platform Technology	--	40
- The total number of needs was 111 before the update. The current 6 out of 9 themes already produced 182 records.



Major Difference

- Interdisciplinary needs will be tracked, e.g.,
 - Diurnal forcing processes, and its interaction with biosphere will be tracked by Atm. Chem. And the Global Water Cycle (include Energy and Radiation)
 - Volcanic ash and gas emission will be tracked by Atm. Chem., the Global Water Cycle, and Applications.
 - Cold Climate Processes will be tracked by Global Carbon Cycle, Global Water Cycle, and Climate Variability and Change



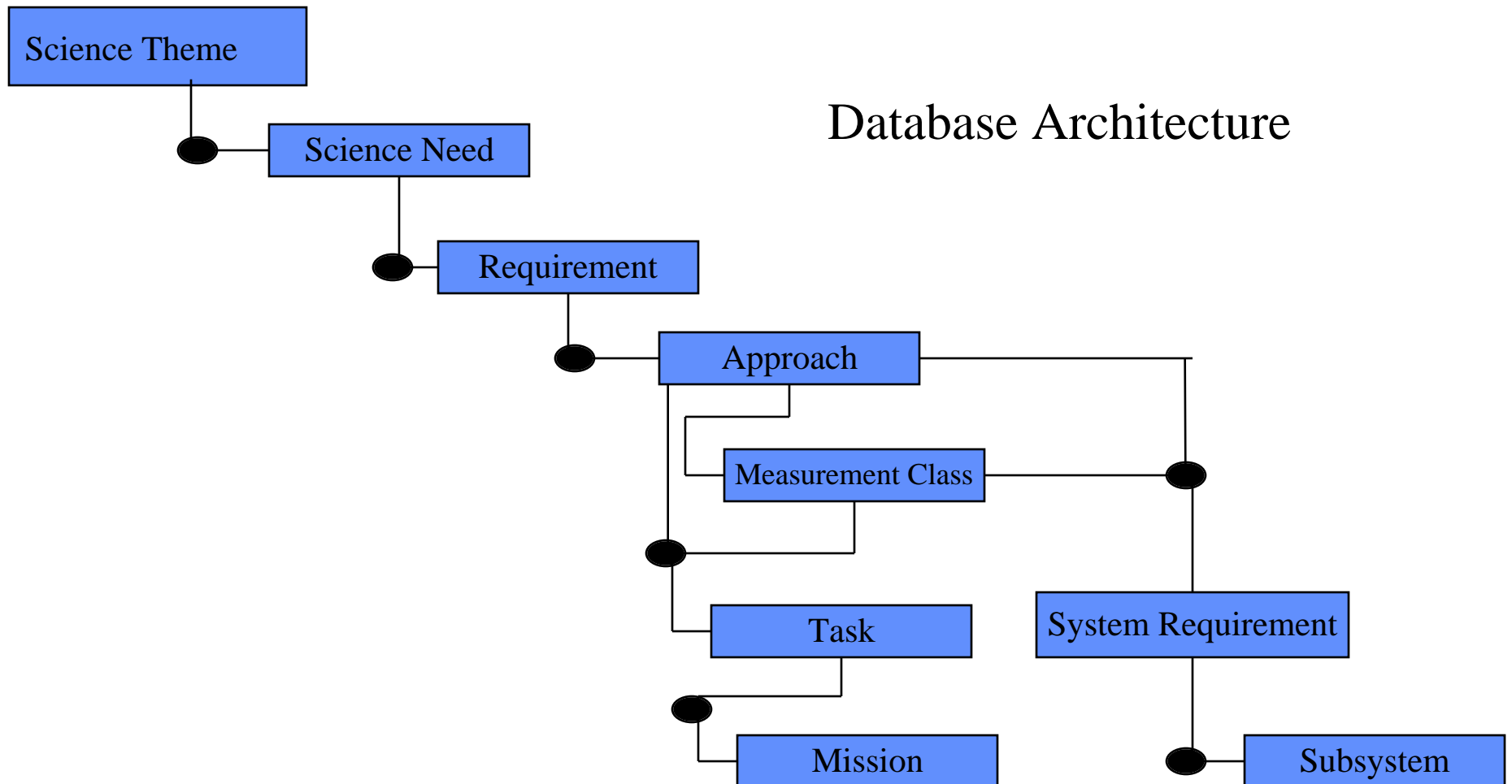
What's Next

- Complete the capability/needs update and have it officially signed off (By end of October, 1999)
- Populate the inventory and link current technology investment to BMPS (continuous process)
 - **IIP**
 - **HPCC**
 - **R&A**
 - **SBIR/STTR**
 - **Others**
 - **AIST**
 - **NMP**
 - **Mission**
 - **Code S funded ES-relevant Technologies**
 - **ATI**
 - **Platform**
 - **CETDP**
- Conduct independent assessment and gap analysis to identify candidates for future trade and option studies. (by 12/99)
- Implement a new relational database to fully reflect the various many-to-many relationships within the database that FileMaker Pro is not sufficient to handle. (By 12/99)
- Implement a new web-based user interfaces (By 2/00)

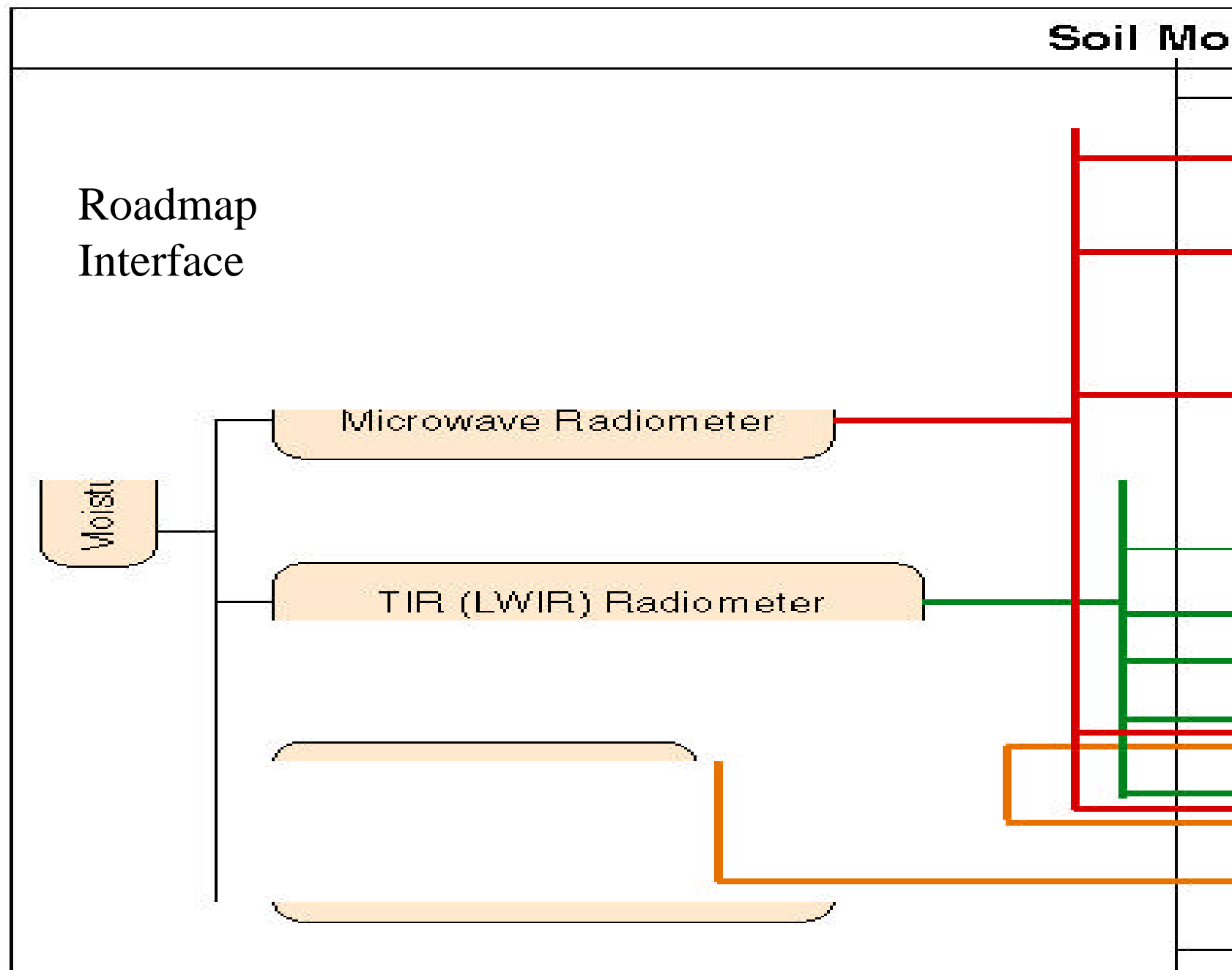


What's Next (Continued)

Database Architecture

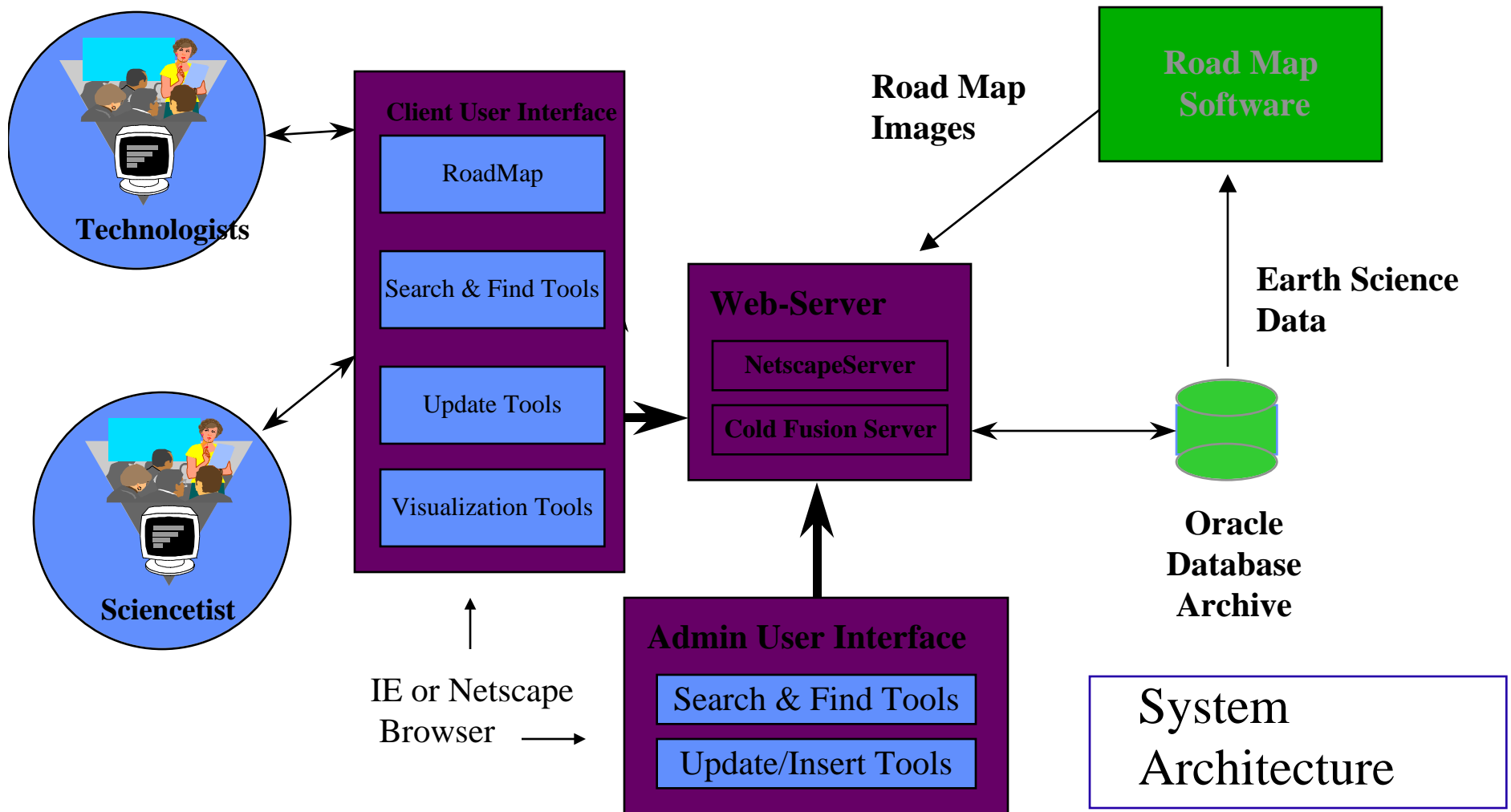


● Many-to-Many Relationship





What's Next (Continued)





How can TST Help

- Review the capability/needs for completeness and accuracy, and provide suggestions/comments to the working group co-chairs (ESTO can always forward the suggestion to appropriate program lead)
 - Atmospheric Chemistry: Phil DeCola & Lee Feinberg
 - Climate Variability & Change: Chet Koblinsky & Eastwood Im
 - Global Water Cycle: **Eric Wood, Yunjin Kim**
 - **Global Carbon Cycle: Diane Wickland, Steve Neek**
 - **Radiation Forcing and Energy Balance: Bob Curran, Steve Sanford**
 - **Solid Earth Science: Erni Paylor, Shahid Habib**
 - **Applications: Lou Walter, Tom Stanley**
 - **Information System Technology: Steve Smith, Karen Moe, Glenn Prescott**
 - **Platform Technology: Loren Lemmerman**
- Review the inventory for completeness and linkage



How Can TST Help (Continued)

- Advise and advertise the ESE Technology Planning Database to make it a useful tool for ESE Technology Program planning



ESTO Program

